

Claims

[c1] What is claimed is:

1.A baseband card for a base transceiver station of a cellular communications network, comprising:

a receive unit comprising:

at least one receive module for receiving an uplink data from an RF signal processing unit; and

a first interface for sending and receiving data; and

a transmit unit comprising:

a second interface for communicating with the receive unit;

a third interface for communicating with the cellular communications network;

an interface controller for receiving the uplink data from the receive unit via the first and second interfaces and for transmitting the uplink data to the cellular communications network via the third interface; and

at least one transmit module for transmitting a downlink data received from the cellular communications network through the third interface and the interface controller to the RF signal processing unit;

wherein the receive unit is serially connected to the transmit unit, and the transmit unit is serially connected

to cellular communications network.

[c2] 2.The baseband card of claim 1 wherein the receive unit further comprises a signal-to-interface ratio measurement (SIRM) circuit for measuring the SIRM signal quality of the uplink data and the transmit module of the transmit unit comprises a transmission power control circuit for processing power control with a mobile device according to the SIRM value.

[c3] 3.The baseband card of claim 1 wherein the transmit unit further comprises a timing control unit for controlling timing of communications among the transmit unit, the receive unit, and the cellular communications network.

[c4] 4.The baseband card of claim 4 wherein the timing control unit generates system frame numbers (SFNs) utilized for controlling the timing of the receive module in the receive unit and for controlling timing of the transmit module.

[c5] 5.The baseband card of claim 5 wherein the transmit unit further comprises a timing synchronization unit for synchronizing multiple baseband cards used in the cellular communications network.

[c6] 6.The baseband card of claim 6 wherein the timing syn-

chronization unit generates Node B frame numbers (BFNs) for synchronizing the baseband cards in the cellular communications network, and the timing control unit generates the SFNs based on the BFNs received from the timing synchronization unit and cell parameters specified by the cellular communications network.

- [c7] 7.The baseband card of claim 7 wherein the SFNs are offset from the BFNs by an offset determined by the cell parameters specified by the cellular communications network.
- [c8] 8.The baseband card of claim 1 wherein the transmit unit further comprises a radio link set combine unit for combining uplink data received from two or more different cells for a single user.
- [c9] 9.The baseband card of claim 1 wherein the receive unit comprises a plurality of receive modules and the transmit unit comprises a plurality of transmit modules, each receive module and transmit module corresponding to different cells in the cellular communications network.
- [c10] 10.The baseband card of claim 1 wherein a low voltage differential signaling (LVDS) device is connected between the RF signal processing unit and the baseband card for transmitting the uplink data from the RF signal process-

ing unit to the receive unit and for transmitting the downlink data from the transmit unit to the RF signal processing unit.

[c11] 11. A baseband card for a base transceiver station of a cellular communications network, the base transceiver station capable of communicating with a mobile device, the baseband card comprising:
a receive unit for receiving an uplink data from an RF signal processing unit, the receive unit comprising a first interface; and
a transmit unit for transmitting a downlink data to the RF signal processing unit, the transmit unit comprising:
a second interface for communicating directly with the receive unit through the first interface; and
a third interface for communicating with the cellular communications network.

[c12] 12. The baseband card of claim 11 wherein the transmit unit further comprises an interface controller for controlling different data to flow via the second or via the third interface.

[c13] 13. The baseband card of claim 11 wherein the receive unit further comprises a signal-to-interface ratio measurement (SIRM) circuit for measuring a signal quality of the uplink data and the transmit unit comprises a trans-

mission power control circuit for processing power control with the mobile device according to the SIRM value.

- [c14] 14.The baseband card of claim 13 wherein the SIRM value is sent from the receive unit to the transmit unit directly, the power control circuit comparing the SIRM value to a reference value.
- [c15] 15.The baseband card of claim 11 wherein the transmit unit further comprises a timing control unit for controlling timing of communications among the transmit unit, the receive unit, and the cellular communications network.
- [c16] 16.A method of communicating using a baseband card in a base station of a cellular communications network, the baseband card comprising a transmit unit and a receive unit, the method comprising:
 - connecting the transmit unit with the receive unit serially;
 - the receive unit receiving an uplink data;
 - the receive unit passing the uplink data to the transmit unit; and
 - sending the uplink data to the cellular communications network by the transmit unit.
- [c17] 17.The method of claim 16 further comprising:

controlling different data to flow between the receive unit and the transmit unit, and between the transmit unit and the cellular communications network.

[c18] 18.The method of claim 16 further comprising:
the receive unit sending a signal-to-interface ratio measurement (SIRM) value for measuring a signal quality of the uplink data; and
the transmit unit commanding a mobile device to control power according to the SIRM value.

[c19] 19.The method of claim 16 further comprising:
the transmit unit controlling timing of communications among the transmit unit, the receive unit, and the cellular communications network.

[c20] 20.The method of claim 16 further comprising:
connecting a plurality of the baseband cards;
the transmit unit generating a Node B frame number (BFN); and
synchronizing timing of the plurality of the baseband cards according to the BFN.